The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A vehicle headlamp control, comprising:

an imaging sensor that senses light in spatially separated regions of a field of view forward of a vehicle; and

a control circuit that is responsive to said imaging sensor in order to determine if individual regions of the field of view include light levels having a particular intensity level in order to identify light sources of interest and provide a control output to said vehicle that is a function of the identification of light sources of interest.

2. The vehicle headlamp control in claim 1 including an exposure control which determines an accumulation period of time said imaging sensor senses light.

3. The vehicle headlamp control in claim 2 wherein said exposure control defines at least two accumulation periods, one of said accumulation periods for detecting oncoming vehicle headlights and another of said accumulation periods for detecting loading vehicle taillights.

4. The vehicle headlamp control in claim 1 wherein said control circuit includes a digital processor which provides a digital value of the sensed light level of each region.

5. The vehicle headlamp control in claim 1 wherein said imaging sensor includes a photosensor array.

6. The vehicle headlamp control in claim 5 wherein said imaging sensor includes a spectral separation device for dividing said photosensors into sensors which are each responsive to a particular spectral region.

7. The vehicle headlamp control in claim 6 wherein said spectral separation device divides said photosensors into red, green, and blue sensors which sense light in either a red, a green, or a blue portion of the spectrum.

8. The vehicle headlamp control in claim 6 wherein said spectral separation device divides said photosensors into red and red compliment sensors which sense light in either a red portion of the spectrum or a portion of the spectrum that is outside said red portion of the spectrum.

9. The vehicle headlamp control in claim 1 wherein said imaging sensor includes an optical device.

10. The vehicle headlight control in claim 9 wherein said optical device produces a higher resolution along an axis of vehicle travel than a resolution off of said axis.

11. The vehicle headlamp control in claim 1 wherein said control circuit switches the vehicle headlights between high-beam and low-beam states.

12. The vehicle headlamp control in claim 1 wherein said control circuit controls the vehicle headlights along a continuously variable value.

13. A vehicle headlight control, comprising:

a solid-state light sensor array made up of a plurality of sensors arranged in a matrix on at least one semiconductor substrate and a spectral separation device to apply particular spectral regions to particular ones of said sensors, wherein each of said sensors responds to light in a particular spectral region;

an optical device for directing light onto said sensor array in a manner which preserves spatial separation of light sources forward of the vehicle; and

a control circuit that is responsive to said plurality of sensors in order to determine if spatially adjacent one or ones of said sensors are sensing light of a particular spectral signature

above a particular intensity level in order to identify light sources that are either oncoming headlights or leading taillights to thereby control the vehicle headlights.

14. The vehicle headlamp control in claim 13 wherein said control circuit selects a first light exposure period for at least a portion of said array in order to detect oncoming headlights and a second light exposure period for at least a portion of said array in order to detect leading taillights.

15. The vehicle headlamp control in claim 14 wherein the same portion of said array senses oncoming headlights and leading taillights and said first and second light exposure periods are sequentially varied.

16. The vehicle headlamp control in claim 14 wherein different portions of said array sense oncoming headlights and leading taillights and each of said portions has one of said light exposure periods.

17. The vehicle headlamp control in claim 14 wherein the length of said second light exposure is at least ten times the length of said first light exposure.

18. The vehicle headlamp control in claim 17 wherein the length of said second light exposure is at least approximately 40 times the length of said first light exposure.

19. The vehicle headlamp control in claim 13 wherein said optical device produces a higher resolution along an axis of vehicle travel than a resolution off of said axis.

20. The vehicle headlamp control in claim 19 wherein said optical device has a magnification that is greater centrally of its field of view than at the periphery of its field of view.

21. The vehicle headlamp control in claim 13 including an ambient light detector which enables said control circuit during low ambient light conditions.

22. The vehicle headlamp control in claim 21 wherein said ambient light detector includes a portion of said sensors that are time-filtered in order to sense long duration changes in sensed light levels.

23. The vehicle headlamp control in claim 22 wherein said portion of said sensors are positioned on said array to receive light from sources close to the earth's horizon.

24. The vehicle headlight control in claim 13 wherein particular ones of said sensors respond to red light in generally a red spectral region and particular ones of said sensors respond to non-red light in a spectral region other than said red spectral region.

25. The vehicle headlight control in claim 24 wherein said control circuit detects leading taillights by determining that at least one of said red light responsive sensors is sensing a light level that is greater than a particular multiple of light sensed by at least one adjacent non-red light responsive sensor and that light level is greater than a particular threshold.

26. The vehicle headlight control in claim 24 wherein said control circuit detects oncoming headlights by determining that at least one of said red light responsive sensors and at least one adjacent non-red light responsive sensors are both sensing light levels within a particular ratio of each other and greater than a particular threshold.

27. The vehicle headlight control in claim 13 wherein said control circuit determines if a particular light source has a particular spectral signature by comparing levels of light sensed by sensors which respond to light in a particular spectral region with levels of light sensed by sensors which respond to light in a different spectral region.

28. The vehicle headlight control in claim 13 wherein said control circuit determines if a particular light source has a particular spectral signature by comparing levels of light sensed by sensors which respond to light in a particular spectral region with a threshold.

29. The vehicle headlight control in claim 28 wherein said threshold is a function of the spatial location of the particular sensor in the array.

30. The vehicle headlight control in claim 29 wherein said threshold is higher for sensors sensing light off a central forward axis of the vehicle than for sensors sensing light along said axis.

31. The vehicle headlight control in claim 28 wherein said control circuit determines if a particular light source has a particular spectral signature by comparing levels of light sensed by sensors which respond to light in a particular spectral region with levels of light sensed by sensors which respond to light in a different spectral region.

32. The vehicle headlight control in claim 13 wherein said solid-state light sensor and said optical device are positioned in a housing behind the vehicle's windshield.

33. The vehicle headlight control in claim 32 wherein said housing is behind a portion of the vehicle's windshield swept by wipers.

34. The vehicle headlight control in claim 33 wherein said housing is mounted to a bracket supporting a rearview mirror.

35. The vehicle headlight control in claim 32 wherein said housing is an interior mirror housing.

36. A method of detecting light sources of interest forward of a vehicle in order to control the headlights of that vehicle, including:

providing a solid-state photosensor array made up of a plurality of sensors arranged in a matrix and mapping particular spatially arranged portions of a field of view forward of the vehicle onto said array in a manner which generally preserves the spatial arrangement of the field of view;

restricting light received by each sensor to a particular spectral region so that each sensor responds to light having a particular spectral range; and

evaluating light levels sensed by each sensor in order to establish a spectral signature of light sources in said field of view in order to identify light sources of interest in said field of view.

37. The method in claim 36 wherein said comparing includes exposing at least a portion of said sensors for a first exposure period in order to identify spectral signatures of headlights and exposing at least a portion of said sensors for a second exposure period in order to identify spectra signatures of taillights.

38. The method in claim 36 further including reading individual light intensity levels of each of said sensors.

39. The method in claim 38 including digital processing of said individual light intensity levels.

40. The method in claim 39 including digital processing using custom digital circuitry.

41. The method in claim 36 wherein said directing light includes a non-linear mapping of the field of view forward of the vehicle onto said array.

42. The method in claim 36 wherein said mapping includes masking portions of the field of view forward of the vehicle.

43. The method in claim 36 wherein said comparing light levels includes comparing light levels with thresholds, said thresholds being different for particular ones of said sensors.

44. The method in claim 43 wherein said thresholds are greater off a central forward axis of the vehicle than on said axis.

45. A method of detecting light sources of interest forward of a vehicle in order to control the headlights of that vehicle, including:

providing a solid-state photosensor array made up of a plurality of sensors arranged in a matrix and mapping particular spatially arranged portions of a field of view forward of the vehicle onto said array in a manner which generally preserves the spatial arrangement of the field of view;

evaluating light levels detected by each sensor in order to identify light sources of interest at least in part as a function of a spatial distribution of each light source in said field of view.

46. The method in claim 45 wherein said evaluating includes establishing a different sensing resolution along an axis of vehicle travel than off of said axis.

47. The method in claim 46 wherein the sensing resolution along said axis is greater than off of said axis.

48. The method in claim 45 including providing an optic device which provides a non-uniform magnification of said field of view.

49. The method in claim 45 wherein said solid-state photosensor array has sensor sizes which are non-uniform in said matrix.

50. The method in claim 45 wherein said identifying light sources of interest includes determining if each sensor is sensing a light level above a threshold level.

51. The method in claim 50 wherein said threshold is non-uniform for said sensors.

52. The method in claim 51 wherein said threshold is lower for sensors sensing portions of said field of view along an axis of vehicle travel than for sensors sensing a portion of said field of view off of said axis.

53. The method in claim 45 including restricting light received by each sensor to a particular spectral region so that each sensor responds to light having a particular spectral range.

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